DOCUMENT RESUME

ED 388 339 JC 950 522

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TITLE Empowering the User.
PUB DATE 10 Dec 93
NOTE 12p.; Paper presented at the Annual CAUSE Conference (San Diego, CA, December 7-10, 1993).
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Administrative Organization; *College Planning; Community Colleges; *Computer Literacy; Computer Networks; *Computer System Design; *Management Information Systems; *Management Teams; Participative Decision Making; Program Development; Program Implementation; Two Year Colleges; User Needs (Information); User Satisfaction (Information)
IDENTIFIERS Cincinnati Technical College OH

ABSTRACT

With respect to the college's information systems, there were three major challenges facing Ohio's Cincinnati Technical College (CTC) in 1991. The expanding use of personal computers (PC's) and non-integrated systems often duplicated efforts and data on CTC's existing computer systems, users were demanding more access to data and more integration of financial and registration systems, and the college's management information system (MIS) department began to be viewed as a barrier to progress rather than a source for solutions. To address these challenges, a team approach was undertaken with the establishment of a task force including representatives from all departments, areas, and levels of the college. The project was organized in three levels: a top-level Executive Systems Review Board for setting overall policy and making decisions on software and hardware, a second-tier implementation committee, and third-level sub-committees on data management and security, training, equipment conversion, and ancillary applications. As a result of the project, overall computer literacy at CTC has been greatly improved, the automated systems have been fully integrated, a network has been installed to provide all employees with access to data, communication among employees has been improved with the use of electronic mail, and the improvements have pr ided options for future development. (TGI)

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EMPOWERING THE USER

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1993 CAUSE CONFERENCE
(SAN DIEGO, CA, DECEMBER 7-10, 1993)

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EMPOWERING THE USER

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ABSTRACT

This presentation describes how Cincinnati Technical College organized its efforts to meet the following challenges:

1. The use of PCs and automated systems was expanding rapidly with little or no thought given to integrating the systems.

2. Users of MIS were demanding more access to the computer-based data and faster response on system problems and on development of new systems.

3. The MIS department was being seen more and more as a barrier to progress rather than as a facilitator and servicer for progress.

The GOALS of this presentation are to describe:

1. The PLAN which was prepared to meet the challenges.

2. The STRATEGIES which were designed to implement the PLAN.

3. The INNOVATION which was necessary to break away from old habits and ways of thinking.

4. The EVANGELISM which was invoked to give leadership to the PLAN.

EMPOWERING THE USER

INTRODUCTION

Cincinnati Technical College (CTC) is a two-year, publicly-assisted technical college which offers fifty different certificates and associate degrees through four separate academic divisions--Business Technologies, Health Technologies, Engineering Technologies, and Humanities and Sciences. Approximately 5,500 students are in attendance at any time during the five academic terms, with about 3,100 FTEs. The special emphasis of the College is cooperative education for which it has been recognized nationally. Most recently, such recognition occurred on the front page of the Wall Street Journal[1] and on the ABC World News Tonight With Peter Jennings.[2]

Like many other two-year colleges, Cincinnati Technical College experienced significant but rather steady enrollment increases in the 1980s despite the decreasing number of high school graduates. In 1990 a new president was installed, James P. Long. Subsequently, enrollment jumped 10 percent and 11 percent in the first two years of his administration. His goal was to lead the College to become a community college. He recognized that additional growth was being jeopardized by outdated and outmoded administrative computing systems. He directed that a complete review of those systems be accomplished. To assist with the review, the College hired a consulting firm. The results of the study and the process which was used to plan and implement the new administrative information system is described below.

REVIEW OF FORCES AT WORK

There were three major forces at work at Cincinnati Technical College in the world of information systems in 1991.

1. Expanding Use of PCs and Non-Integrated Systems

   PCs were becoming ubiquitous. Some were connected to the larger computers in use (IBM 4361 mainframe for student systems, IBM System/36 for Financial Systems), but more and more were in use for stand-alone systems which made little, if any, use of data already in computer systems at CTC. Often, in fact, the data being processed were data which already existed in the large computers but which had been separately entered into the PC. Separate PC-based systems were used to re-enter data from computer reports in order to prepare reports required for the Ohio Board of Regents. Many analytical reports were also prepared using LOTUS 123 for different financial purposes using data which already existed in the System/36 financial systems.

2. Users Demanding More Access to Data and More Integration of the Systems

   The use of second-generation software had provided some basic integration of some parts of the student services systems, but there was only very incomplete integration

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1 Ralph T. King, Jr. "Real Help: Job Retraining Linked Closely to Employers Works in Cincinnati," Wall Street Journal, 19 March 1993, pp. 1, A9.

2 "American Agenda," ABC World News Tonight With Peter Jennings, 15 April 1993.

with the financial systems. Also, the Financial Aid process was manual and completely separate from the automated systems. The maintenance of the automated systems was extremely difficult because of poor documentation and because of relatively high turnover in the MIS department.

The MIS department was in a Catch-22 situation. When it attempted to respond to the user-demanded changes to the current systems, it often introduced additional reporting problems which exacerbated the difficulties and resulted in increased user dissatisfaction. The users had seen enough of the level of integration and data access which were available with fully-integrated systems to become much more demanding in calling for those capabilities at CTC.

The mainframe in use was being used to full capacity and response time was not acceptable at registration for a new term. Since CTC has five terms each year and five registration periods each year, the complaints about poor response time had become almost a drumbeat. The poor response time from the mainframe systems and the poor response from the MIS Department when system changes were required built a user perception of an MIS Department which provided poor service overall.

3. MIS Being Seen More and More as a Bottleneck

Because of the central role that the MIS department played in the operation and maintenance of the automated systems, MIS was blamed more and more for problems which affected student service, preparation of accurate reports, and the ability to respond to regulatory changes. This third challenge was particularly worrisome because the solution to the first two challenges clearly depended on effective leadership and teamwork from the MIS department. The longer MIS was seen as "part of the problem" the more difficult it would be for MIS to be seen as "part of the solution."

Over time, the user community came to accept the MIS department's poor performance as a fact. There was at least one benefit to the users from this fact. Whether it was true or not, it was relatively simple to blame the MIS system for any and all problems which occurred. This finger-pointing was a convenient cover for other problems and became a part of the culture. Everyone knew that the MIS systems were unreliable and set their expectations and attitudes to reflect that knowledge. The MIS personnel realized that they were being blamed for problems which pre-dated their employment at CTC and that their role was not regarded as valuable and supportive. This realization contributed to the morale problems within the department and an adversarial relationship with the users. Both of these factors contributed to a high rate of turnover in the MIS department.

PLAN TO ADDRESS THE THREE CHALLENGES

CTC decided to attack all three challenges at once with a team approach. The design of this team approach was based on the work done at Sinclair Community College[3] and at

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3 Stephen Jonas and others, "Selecting an Information System for The '90s--Can a User Driven Process Work?" Presentation at the 1990 Annual Conference of the League for Innovation in the Community College, October 21-24, 1990, p. 3.

Georgia Tech[4]. The team would include both the users and the MIS personnel with the users providing the overall leadership to the effort and having the final responsibility for the major decisions. It would include both management and workers, from the user departments and from MIS, with input regularly gathered from all. It would include both the academic and the administrative areas because it was clearly seen that a key part of integrating the automated systems was integrating the ability to access the functions and data those integrated systems would provide. This integration had to cross all lines of the organization through the use of systems for which all parts of the organization felt responsibility.

A task force was formed which included representatives from all departments, all areas, and all levels of the organization. This Task Force was asked to be a sounding board and a generator of ideas for the overall project. It continued to meet periodically throughout the planning and the implementation stages of the project.

An approach to project management was designed which would use the organizational structure which was already in existence to populate three levels of project effort.

Top Level - Executive Systems Review Board (ESRB)

The Executive Systems Review Board (ESRB) included the academic deans; the vice presidents for student services, finance, and administrative services; the dean of admissions and counseling; and the director of human resources; with the director of MIS as an ex-officio member. An organizational chart appears below in Figure 1.

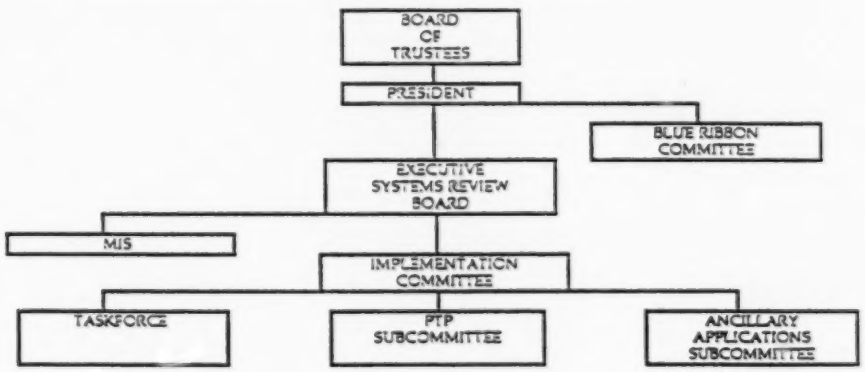

Figure 1: Organizational Chart for the Update '93 Project

The ESRB was charged with the responsibility for setting overall policy for the project and for making the major decisions concerning computer software, hardware, and personnel assignments. It guided the development of a Request For Proposal (RFP) and led the selection process to evaluate and choose software and hardware vendors. The process included in-depth interviews with all members of the Task Force concerning their areas' current systems, system problems, and needs for the future. These interviews resulted in written statements of needs which were consolidated into the RFP.

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4 Linda Martinson, "Scrapping Patched Computing Systems: Integrated Data Processing for Information Management," NACUBO Business Officer, June 1991, p. 35.

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The project to upgrade the Administrative MIS to meet the requirements stated in the RFP was named UPDATE '93. The acronym stands for User Planned Data Access Toward Empowerment. The name intended to identify not only the process of upgrading the systems but also the teamwork approach being used.

The specific goals which were set for the UPDATE '93 project were the following.

1. Use of a relational database management system to support data integration, easy access, and powerful reporting tools.

2. The ability to communicate from any PC or terminal in the College to any other PC or terminal in the College.

3. The ability to download selected data from the central database to department PCs for further analysis.

4. Fast access to the data to improve service to the students in all interactions with the College.

5. The ability to add new features and functions (E-Mail, telephone registration, INTERNET access, etc.) without major changes to the basic system.

6. The ability to greatly expand the number of students served without a major expense to upgrade the hardware or software.

To advise him on the contents of the RFP and the criteria for the selection of the new system software and hardware, the president recruited a Blue Ribbon Committee of data processing executives from the business community. These vice presidents of major insurance, banking, and information systems firms met with the president and representatives of the ESRB to provide feedback, direction, and confirmation of the approach used. When the president took the recommendation for the purchase of a major new system to the Board of Trustees, he had not only the selection of the internal committee but also the concurrence of an independent outside panel with many years of experience in purchasing and designing software solutions.

Second Level - Implementation Committee

Once the selection of software and hardware had been made, an operating committee was established. It was called the Implementation Committee. It had the responsibility for making the decisions necessary to make the project happen. Those key executives in whose areas the new system would be installed were included, namely the registrar, controller, and the dean of admissions and counseling. In order to maintain a balance of academic and administrative viewpoints, the dean of health technologies, the senior academic dean at CTC, was also included. The director of MIS was made an ex-officio member. The selection of these members was made purposely to include two members of the ESRB in order to provide clear communication paths horizontally as well as vertically within the organization.

The Implementation Committee decided to set up sub-committees which would be populated with members of the Task Force and MIS department people.

Third Level - Sub-Committees

Four sub-committees were formed initially. The subcommittees were composed of midlevel managers and staff who would be ultimately responsible for working with the new system on a day-to-day basis. The subcommittees provided leadership opportunities and decision-making authority to persons who were not used to having these roles within the organization.

1. DATA MANAGEMENT AND SECURITY - to plan what data needed to be converted and what security needed to be applied to the system.

2. TRAINING - to plan and guide the training required.

3. CONVERSION - to develop and recommend the conversion sequence to be followed.

4. ANCILLARY APPLICATIONS - to make sure that any current needs for automated systems which were not included in the packaged software were addressed during the life of the project.

The four subcommittees met regularly for several months. Through their input, they laid the foundation for the implementation of the new system. The subcommittees crossed departmental lines and initiated the team building efforts. Subsequently, when the conversion became the primary focus, the Data Management and Security, the Training, and the Conversion subcommittees were combined into a single group called the Planning-Training-Problem Identification (PTP) subcommittee. PTP included all of the key supervisors from the user departments and all of their MIS teammates.

NEW STRATEGIES DEVELOPED

From the experiences gained by site visits during the selection process, the project leadership realized that the implementation phase would provide the greatest test of the teamwork approach. In order to help assure success, several strategies were developed.

1. Users who have PCs but do not understand them well must be made more computer-literate. Training classes on PC Fundamentals and DOS were developed and implemented using a "train the trainer" approach in order to institutionalize the knowledge. The training was conducted by a team made up of user personnel and MIS personnel. It included representatives from the academic areas as well as the administrative areas. A new E-Mail system was selected and installed on the new administrative network to help solidify the knowledge which was gained in the PC training.

2. Users must be provided better access to data through an integrated software system. This system is built on a Relational Database Management System (RDBMS) in order to provide the tools needed to effectively manage the database and to support ad hoc access (QUERY) to the database. To build on the training done earlier, the software vendor was brought in to CTC to conduct focused on-site training on the software modules. This system software module training involved both user and MIS personnel and was accomplished again using the "train the trainer" approach. Doing the training on-site allowed a much more focused effort. All questions and concerns were CTC's questions and concerns. All examples and solutions were

CTC examples and solutions. Training on the QUERY capability was provided to key personnel in all departments, not just to MIS personnel. User personnel were involved in helping to deliver the QUERY training to other units.

CTC recognized that empowerment of the users depended on three separate ingredients, computer literacy, integrated systems, and the Query capability. (See Figure 2.) Each of these ingredients needed to be acquired over a period of time, in an integrated manner.

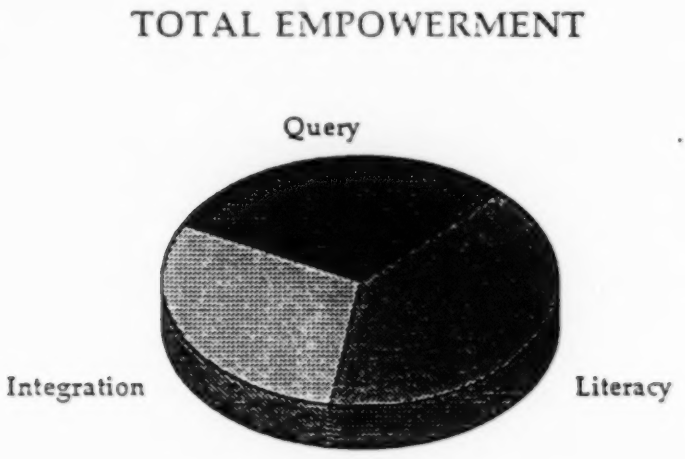

Figure 2: Computer Literacy • Integrated Systems • Query = Total Empowerment

3. MIS personnel must be reoriented to a user-service point of view. This change of attitude was accomplished through the identification and development of leadership within the MIS personnel, through the team-building previously described, and through assigning MIS personnel to specific teams with user personnel. User managers were regularly asked for input concerning how well the MIS personnel were supporting the efforts of the team. Problems which were identified were addressed immediately. In addition, MIS personnel were regularly asked for input concerning the cooperation being shown by the user personnel. Problems identified with those relationships were also immediately addressed.

   The modus operandi for addressing teamwork problems, from whatever source, was to meet with the personnel involved to review the problem and to develop a solution to which all parties agreed. If necessary, the next higher level of management was involved in the discussion in order to reach a consensus on the problem definition and on a solution. Since all of the departments involved in the project already had key executives on the different teams, it was relatively simple to gather the necessary personnel together and focus their attention on a common definition of the problem. In a few cases, it was necessary to raise the problem to the level of the ESRB in order to achieve the necessary level of cooperation. With all parties generally knowledgeable concerning the overall project, it was not necessary to prove problems existed so much as it was necessary simply to identify the problem and to show how it was interfering with effective progress. In addition, it was stated as policy that UPDATE '93 was to be user-driven with all major decisions made by the users.

INNOVATIONS IMPLEMENTED IN IDEAS AND IN ACTIONS

The project leadership introduced a number of innovative ideas within the implementation phase. First, teamwork was stressed as essential, not just a good idea. Good teamwork was recognized and rewarded with special recognition during meetings. Poor teamwork was also recognized, and appropriate corrective actions were taken. The previous adversarial relationships and attitudes were weeded out through joint successes and through recognition of the essential need for the full participation of all those involved. Second, decisions were not allowed to be made by single individuals, whether the individuals were department managers or vice presidents. All decisions had to be joint (integrated) decisions in order to successfully implement the new integrated system. Third, MIS personnel were not separate from the team effort. They were expected to be team contributors, not remote gurus or gofers to be ordered about. Fourth, the new system was not an end in itself, but the first stage of a process which would be continuously reviewed and improved. The Total Quality Management[5] approach, with the general recognition for effectiveness it has received in industry, was most helpful in this effort to convince the staff that change is part of the new way of operating.

In addition to the innovative ideas, a number of new actions were introduced. First, team assignments were announced publicly, and team performance was recognized publicly. Second, inter-department training was made standard. The Admissions personnel, once they had learned their module, were expected to train other departments on how that module worked. This approach solidified their understanding of their module's functions and contributed to teamwork and improved communications. Third, quick identification of problems became the order of the day. Anyone who did not identify problems of which they were aware became "part of the problem." Fourth, recognition and celebration of good performance and of successes became a regular part of the weekly meetings of the different working groups.

EVANGELISM

To break through the barriers which the culture at CTC presented, the project leadership continually stressed the inadequacies of the current situation, the benefits of the new system, and the essential need to implement the new system in order to prepare CTC for the future.

This evangelism took several forms. First, the Board of Trustees and the president confirmed the goals to be achieved with the new system. This confirmation was invoked to help add force and credibility to the need to assign all necessary resources to complete the tasks. Second, management stressed the total inadequacy of the current system and the essential need for change. Third, MIS personnel continually sold the excellent benefits to be achieved through the empowerment of the users. Fourth, several boosters of the new system were identified and encouraged to speak out positively among their peers and their staff about the benefits of the system, the importance of moving forward, and the need to meet project deadlines.

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5 W. Edwards Demming, Out of the Crisis, Massachusetts Institute of Technology, Center for Advanced Engineering Study, Cambridge, Massachusets 1986, p. 4.

RESULTS ACHIEVED

As a result of the successful implementation of these plans and strategies, these positive results have been achieved.

1. The computer-literacy of the organization has been upgraded.

2. The users and the MIS personnel have a deeper understanding of the essential value which each group brings to the work.

3. The automated systems are fully integrated and provide a solid basis on which to improve service to the students and to upgrade overall efficiency.

4. The installed network enables all employees to access the data they need to fulfill their assigned responsibilities.

5. Communication between and among all employees is faster, more actionable, more accurate and less-paper dependent than before as a result of the use of E-Mail.

6. The future developments in computer systems are now options which are available to CTC. There are no artificial barriers in the way to the use of telephone registration, access to INTERNET, electronic exchange of data files, or other new developments.

7. Users have access to the data on the central system and can download a copy of selected data to their PC for further analysis.

The system configuration has been altered dramatically. Figure 3 is a visual representation of the automated systems before the conversion.

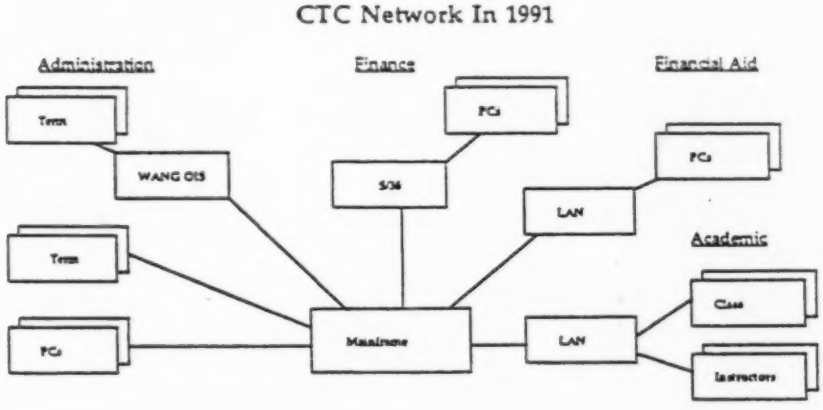

Figure 3: CTC Information Systems Before Update '93

The new Information Network eliminates the hardware variety and network complexity which existed in 1991 and provides simple, direct access to all network services. (See Figure 4.) In summary, the new CTC Information Network provides a solid basis for future growth in the use of the database and in communication across the network. Users are now truly empowered.

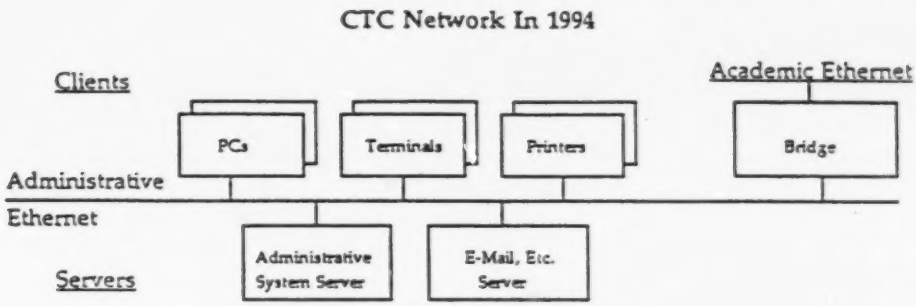

Figure 4. CTC Information Systems After Update '93.

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